

What is claimed is:

1. A method of operating a wireless communication system that reuses Pseudo-random Noise (PN) offsets within at least one cell of the wireless communication system, the method comprising the steps of:

5 providing a plurality of sectors that collectively provide wireless coverage of an area of the at least one that emanates from a base station, the plurality of sectors having at least one or more sector groupings of at least two or more non-adjacent sectors, each sector grouping having shared PN offsets;

10 determining a particular sector of the plurality of sectors that services at least one communication unit; and

15 detecting which of at least the other sectors in the sector grouping that includes the particular sector area have one or more reverse link channel multipath links between the at least one communication unit and the base station.

2. The method according to claim 1, further comprising the step of:

transmitting data from the at least one base unit on a forward link channel from the particular sector area and the other sectors in the sector grouping that includes the particular sector area that have been detected as having a multipath link between the at least one communication unit and the base station.

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3. The method according to claim 1 wherein the sectors are located with respect to one another at a fixed spatial separation.

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4. The method according to claim 1, wherein there are four sector groupings each containing three sectors.

5. The method according to claim 4, wherein the sectors within a grouping are located relative to one another at a fixed spatial separation.

6. The method according to claim 5, wherein the fixed spatial separation is 120 angular degrees.

10 7. The method according to claim 1, wherein the wireless communication system is a CDMA system.

8. The method according to claim 1 wherein the plurality of sector is arranged with a repeating sequence of sectors, the sequence including at least 15 one sector from each grouping of sectors.

9. The method according to claim 1 wherein each PN offset has an associated pool of Walsh codes.

20 10. The method according to claim 1, wherein the step of detecting includes scanning reverse link spatial information and characterizing a multipath manifold of the at least one communication unit.

11. The method according to claim 1, wherein the sectors are formed using 25 one or more adaptive antenna arrays.

12. The method according to claim 11, wherein the one or more adaptive antenna arrays are each comprised of three antenna portions each having a planar face, wherein the planar face of an antenna portion is oriented 60 5 degrees from the planar faces of each of the other two antenna portions in the antenna array.

13. The method according to claim 12, wherein each antenna portion is comprised of four adaptive antennas, each of the adaptive antennas having a 10 respective aimed beam direction corresponding to a respective sector.

14. The method according to claim 1, wherein the at least one communication unit is a mobile telephone.

15. 15. An apparatus that reuses Pseudo-random Noise (PN) offsets within at least one cell of a wireless communication system comprising:  
a base station configured to create a coverage area of the at least one cell through transmitting and receiving communication signals, the base station further comprised of:

20 an antenna array having a prescribed number of antennas, each antenna configured to create a corresponding sector, wherein PN offsets are shared between two or more non-adjacent sectors;

a plurality of receivers where each receiver is connected to a corresponding antenna of the prescribed number of antennas and is configured

to receive information from at least one communication unit within the at least one cell;

a plurality of searching devices where each searching device is connected to a corresponding receiver of the plurality of receivers and is

5       configured to determine if the communication unit has a link to the base unit through the corresponding sector;

          a forward link transmitter; and

          a decision logic that is connected between the plurality of searching devices and the forward link transmitter and is configured to

10      determine which sectors having shared PN offsets are in a communication link with the at least one communication unit and to direct the forward link transmitter to transmit information to the communication unit via all sectors having shared PN offsets that also are in a communication link with the at least one communication unit.

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16.     The apparatus according to claim 15, wherein the antenna array is comprised of one or more adaptive antenna arrays.

17.     The apparatus according to claim 16, wherein the one or more adaptive antenna arrays are each comprised of three antenna portions each having a planar face, wherein the planar face of an antenna portion is oriented 60 degrees from the planar faces of each of the other two antenna portions in the antenna array.

18. The apparatus according to claim 17, wherein each antenna portion is comprised of four adaptive antennas, each of the adaptive antennas having a respective aimed beam direction corresponding to a respective sector, wherein the beam direction of each of the adaptive antennas is controlled by a beam steering controller connected to the plurality of receivers.

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19. The apparatus according to claim 15, wherein the sectors are located with respect to one another at a fixed spatial separation.

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20. The apparatus according to claim 15, wherein there are four sector groupings each containing three sectors.

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21. The apparatus according to claim 20, wherein the sectors within a grouping are located relative to one another at a fixed spatial separation.

22. The apparatus according to claim 21, wherein the fixed spatial separation is 120 angular degrees.

23. The apparatus according to claim 15, wherein the wireless communication system is a CDMA system.

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24. The apparatus according to claim 15 wherein the plurality of sector is arranged with a repeating sequence of sectors, the sequence including at least one sector from each grouping of sectors.

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25. The apparatus according to claim 15 wherein each PN offset has an associated pool of Walsh codes.

26. The apparatus according to claim 15, wherein the decision logic is further configured to scan reverse link spatial information concerning the at least one communication unit and, in turn, characterize a multipath manifold of the at least one communication unit.

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27. The apparatus according to claim 15, wherein the at least one communication unit is a mobile telephone.

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